REMARKS/ARGUMENTS

Favorable reconsideration of the present application is respectfully requested.

Claim 40 has been amended for clarity.

It is a feature of the invention set forth in Claim 40 that in a liquid injector for injecting at least a contrast medium into a subject whose fluoroscopic image is to be captured by an imaging diagnostic apparatus:

> the calculated injection pattern *for each injection* of said contrast medium into a subject comprises a variable injection rate and the *predetermined injection time*, wherein the variable injection rate varies based on body weight of the subject, and *wherein the predetermined injection time is unchanged for each said injection* of said contrast medium into a subject. (Emphasis added).

That is, as is described in the specification at page 14, lines 21 to page 15, line 2:

> When the total amount of the contrast medium to be injected is thus calculated, if the data of the injection rate is registered according to a variable pattern having a waveform as shown in Fig. 10, then the waveform of the variable pattern is vertically moved *while the period of time consumed to inject the contrast medium remains unchanged*, so that the area surrounded by the waveform, the x-axis, and the y-axis corresponds to the total amount of the contrast medium to be injected. (Emphasis added).

For example, as shown in the annotated exemplary Figure 10 reproduced below, if a patient's weight increases, whereby the total volume of contrast medium to be injected increases, the injection rate of the (exemplary) variable pattern is vertically moved upward to the include the gray area while the period of time consumed to inject the contrast medium remains unchanged.

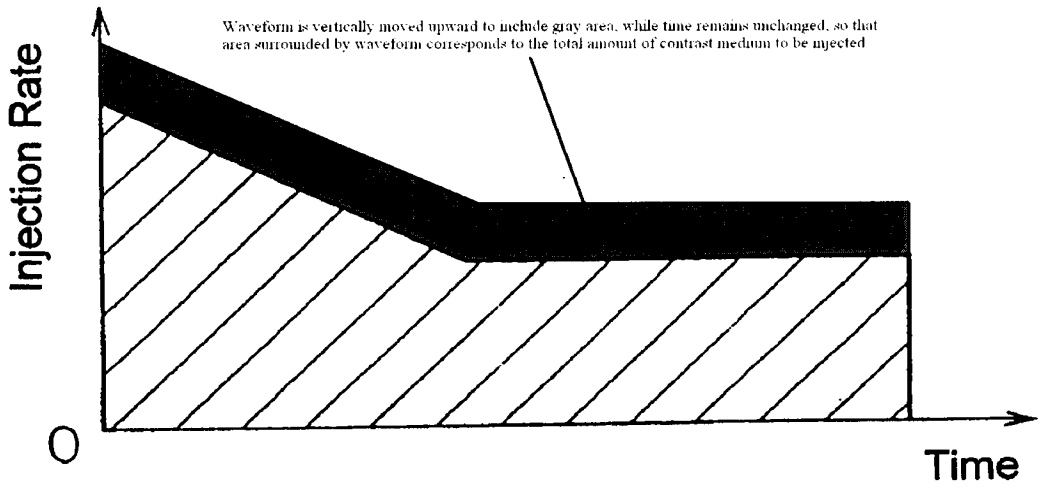


Fig.10

By so maintaining a predetermined injection time unchanged while changing the injection rate to achieve the appropriate dose of contrast medium for each subject, the timing when the concentration of the contrast medium is at the optimum value (Fig. 11) remains substantially the same for different subjects and for different imagings of the same subject. For example, since the injection time is always the same, the contrast medium concentration curves for different imagings with different subject data will be similar to that shown in Fig. 1-A below. This is advantageous since the operator can then time the fluoroscopic image capture for the maximum concentration, so that lower doses of contrast medium can be used. On the other hand, where the injection time is changed for different subject data, the peak concentration times will vary for different imagings, as in Fig. 1-B below. This is problematic since the operator must then refer to the subject data to calculate when to capture a fluoroscopic image for maximum concentration.

Fig. 1-A

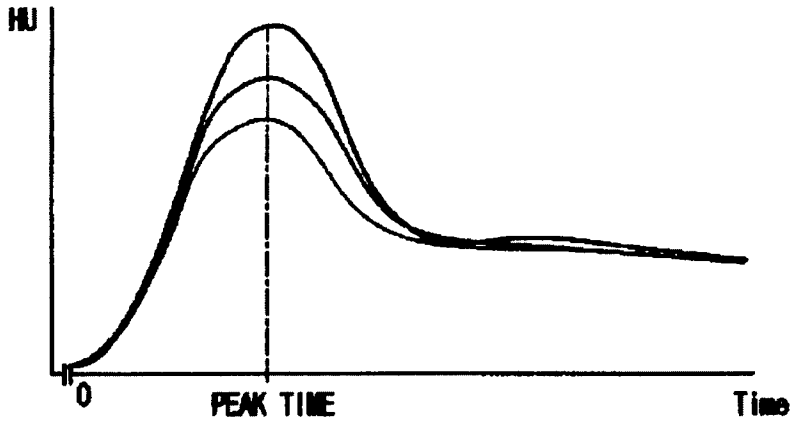
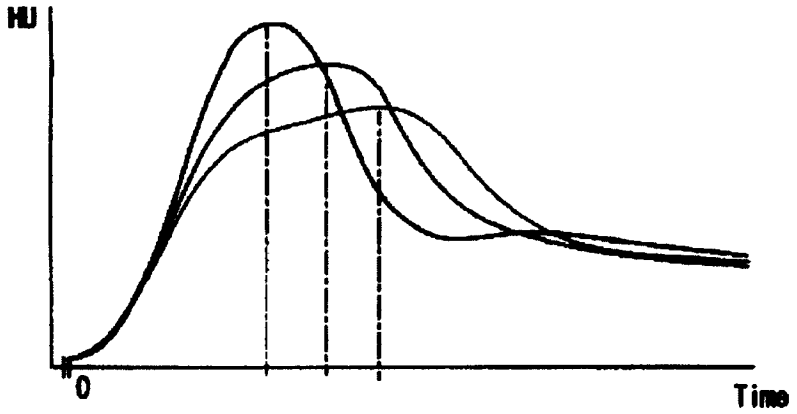


Fig. 1-B



Thus, in accordance with the invention, the operator (physician) does not determine the time length of the injection for a given region to be imaged. Instead, for a given region to be imaged, a base-operation condition, including a predetermined injection time for the injection, is read out from a condition storage device, wherein the predetermined injection time is unchanged for each injection of the contrast medium into that region of a subject.

Claims 40-49 were again rejected under 35 U.S.C. § 103 as being obvious over Uber et al in view of Duchon, Cherek et al and Dahlin et al, wherein Duchon, Cherek et al and

Dahlin et al were only cited for teachings related to touch screens. Critical to this rejection is the assertion that Uber et al teaches that the "system can automatically load [a] predetermined injection time" (p. 3, line 20; p. 6, line 2) and that the system would be able to use information on a doctor's preference to customize procedures. The rejection, as based on these points, is respectfully traversed.

Uber et al discloses an automatic contrast medium dosing system for imaging. According to Uber et al, for the system corresponding to Table 1, "the operator enters the patient specific data, and the volume, concentration and injection parameters are displayed for the operator" (col. 7, lines 49-51). Table 1 "provides an outline of the factors which the system may consider in evaluating the appropriate concentration of contrast media and injection rate for a particular patient as well as the general effect an increase in these factors would have on calculation of the injection parameters" (col. 8, lines 8-13). These factors include the length of the scan as a measure of the flow rate. **However, in no case is it described that the system will "automatically load [a] predetermined injection time."** Instead, Fig. 4 only shows the flow rate, volume and time delay as concentration injection parameters determined by the system (step 92).

Thus, contrary to the statements in the Office Action, Table 1 of Uber et al does not disclose "duration of injection" as a calculated injection parameter. More particularly, it does not suggest that the "injection time is unchanged for each ... injection of said contrast medium into a subject."

The Office Action has also particularly relied on the description in col. 13 of Uber et al that different doctors may prefer different injection profiles, including different injection durations, whereby the "system would be able to use information on a doctor's preference to customize procedures ... the system would make minor adjustments to the weight given to variables in the injection parameter calculation algorithm" (col. 13, lines 41-48). While this

may be so, this disclosure merely highlights the differences between the invention and Uber et al. **Even if the injection time were disclosed in Uber et al as one of the calculated injection parameters, the description that "the system would make minor adjustments to the weight given to variables in the injection parameter calculation algorithm" indicates that the calculated parameters are not fixed or constant, and so *teaches away* from a predetermined injection time that "is unchanged for each ... injection of said contrast medium into a subject."**

Finally, the Office Action has deemed that user preference would, as a simple design choice, render the customization of any parameter in Uber et al to be obvious (see paragraph bridging pp. 3-4). Presumably, it is the position of the Office Action that maintaining a predetermined injection time unchanged for each injection of contrast medium into a subject is therefore obvious as a "design choice," without any further need for a motivation or teaching in the art.

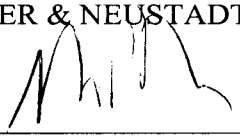
However, this conclusion of obviousness based only on a "design choice" is not supportable where, as here, the prior art teaches away from the invention and the invention provides "more than predictable results." See the PTO's *Examination Guidelines Update: Developments in the Obviousness Inquiry After KSR v. Teleflex*: "A claimed combination of prior art elements may be nonobvious where the prior art teaches away from the claimed combination and the combination yields more than predictable results." As already discussed, Uber et al teaches away from fixed injection parameters, and the fixed injection time of the invention permits the timing of the fluoroscopic image capture to be invariably set for the maximum concentration. As recognized by the PTO guidelines, an inventive feature that both runs contrary to the teachings of the prior art and provides an improved result that is not expected in the prior art, cannot be dismissed as merely the obvious result of a design choice.

Since Duchon, Cherek et al and Dahlin et al were only cited for teachings related to touch screens, it is respectfully submitted that the claims define over this prior art.

Applicants therefore believe that the present application is in a condition for allowance and respectfully solicit an early Notice of Allowability.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Customer Number
22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 08/07)

Gregory J. Maier
Registration No. 25,599
Robert T. Pous
Registration No. 29,099
Attorneys of Record